

CLAIMS

Sub B2
1. A method of manufacturing a semiconductor device comprising a step of placing a semiconductor assembly in
5 which a semiconductor chip is secured to a die pad of a lead frame in a cavity of a mold and sealing the semiconductor assembly with a resin injected into the cavity,

wherein at least one support pin positioned
10 substantially on the axis of a resin injection port of the mold is caused to come in contact with the semiconductor assembly; and

wherein the resin injected into the cavity from the resin injection port is cured after the support pin has
15 been pulled into the mold.

2. The method of manufacturing a semiconductor device as defined in claim 1, wherein the support pin is caused to come in contact with the die pad of the semiconductor
20 assembly.

3. The method of manufacturing a semiconductor device as defined in claim 1, wherein a plurality of the support pins are arranged substantially on the axis of the resin
25 injection port.

4. The method of manufacturing a semiconductor device

as defined in claim 2, wherein a plurality of the support pins are arranged substantially on the axis of the resin injection port.

5. The method of manufacturing a semiconductor device as defined in ~~any one of claims 1 to 4,~~

wherein the semiconductor assembly is pushed by the support pin in a direction away from the previous position of the contact portion of the support pin.

6. The method of manufacturing a semiconductor device as defined in ~~any one of claims 2 to 4,~~

wherein the semiconductor assembly is placed in the cavity with the die pad provided on the lower side.

7. The method of manufacturing a semiconductor device as defined in claim 5,

wherein the semiconductor assembly is placed in the cavity with the die pad provided on the lower side.

8. The method of manufacturing a semiconductor device as defined in ~~any one of claims 2 to 4,~~

wherein the semiconductor assembly is placed in the cavity with the die pad provided on the upper side.

9. The method of manufacturing a semiconductor device as defined in claim 5,

wherein the semiconductor assembly is placed in the cavity with the die pad provided on the upper side.

10. The method of manufacturing a semiconductor
5 device as defined in claim 1,

wherein the support pins are caused to come in contact with both the top and bottom of the semiconductor assembly.

11. The method of manufacturing a semiconductor
10 device as defined in claim 1,

wherein a pair of support pins is caused to come in contact with the suspension leads that connect the die pad to the lead frame.

12. A method of manufacturing a semiconductor device
15 comprising the steps of:

supporting a heat radiator placed in a cavity of a mold with at least one support pin provided substantially
20 on the axis of a resin injection port;

placing a die pad of a lead frame to which a semiconductor chip is secured on the heat radiator and closing the mold; and

curing a resin injected into the cavity from the
25 resin injection port after pulling the support pin into the mold.

13. The method of manufacturing a semiconductor device as defined in claim 12,

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12A, 12B
wherein a recess for preventing mispositioning is formed on a lower surface of the heat radiator and the heat
5 radiator is supported by the support pin in the recess.

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14. The method of manufacturing a semiconductor device as defined in claim 12 ~~or 13~~, wherein a plurality of the support pins are arranged substantially on the axis of
10 the resin injection port.

15. A molding device for a semiconductor device comprising:

15 a mold which is capable of being opened or closed and is provided with a cavity for placing a semiconductor assembly which comprises a semiconductor chip secured to a die pad of a lead frame;

a resin injection port provided to the mold for injecting a resin into the cavity;

20 at least one support pin provided in the cavity substantially on the axis of the resin injection port such that the support pin is able to enter into or be pulled out of the cavity to come in contact with the semiconductor assembly in the cavity; and

25 an actuator which moves the support pin in a direction of the axis of the support pin.

inherent

16. The molding device for a semiconductor device as defined in claim 15, wherein a plurality of the support pins are arranged substantially on the axis of the resin injection port.

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17. The molding device for a semiconductor device as defined in claim 15 ~~or 16~~,

wherein the mold consists of an upper mold and a lower mold which together form the cavity, and the support
10 pin is provided in the lower mold.

18. The molding device for a semiconductor device as defined in claim 15 ~~or 16~~,

wherein the mold consists of an upper mold and a
15 lower mold which together form the cavity, and the support pin is provided in the upper mold.

19. The molding device for a semiconductor device as defined in claim 15 ~~or 16~~,

20 wherein the mold consists of an upper mold and a lower mold which together form the cavity, and the support pin is provided in each of the upper and lower molds.

20. The molding device for a semiconductor device as
25 defined in claim 15 ~~or 16~~,

wherein the support pin is provided at a position corresponding to the die pad of the semiconductor assembly

placed in the cavity.

21. The molding device for a semiconductor device as defined in claim 17,

5 wherein the support pin is provided at a position corresponding to the die pad of the semiconductor assembly placed in the cavity.

10 22. The molding device for a semiconductor device as defined in claim 18,

wherein the support pin is provided at a position corresponding to the die pad of the semiconductor assembly placed in the cavity.

15 23. The molding device for a semiconductor device as defined in claim 19,

wherein the support pin is provided at a position corresponding to the die pad of the semiconductor assembly placed in the cavity.

20 24. The molding device for a semiconductor device as defined in claim 15,

wherein a pair of support pins is provided substantially on the axis of the resin injection port; and

25 wherein the support pins are placed at positions corresponding to suspension leads which connect the die pad of the semiconductor assembly to the lead frame.

25. The method of manufacturing a semiconductor device as defined in claim 15 ~~or 16~~, wherein the actuator is a servomotor.

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26. The method of manufacturing a semiconductor device as defined in claim 17, wherein the actuator is a servomotor.

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27. The method of manufacturing a semiconductor device as defined in claim 18, wherein the actuator is a servomotor.

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28. The method of manufacturing a semiconductor device as defined in claim 19, wherein the actuator is a servomotor.

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29. A semiconductor device manufactured by the method as defined in ^{Claim 1} ~~any one of claims 1, 2, 3, 4, 10, and 11.~~

30. A semiconductor device manufactured by the method as defined in claim 12 ~~or 13~~.